

REMARKS

Claims 1 to 18 are pending. Claims 1, 9 and 15 are independent. Favorable reconsideration and further examination are respectfully requested.

Initially, we affirm the election of species 1, claims 1 to 8. We, however, traverse the restriction. In this regard, the reasons set forth for the restriction are as follows:

3. The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: Species 1's special technical feature lies (a) in the channels in the distribution foil extend from a first edge to a second edge and (b) in the presence of the cover foil extends over the distribution to enclose the distribution foil channels. Species 2's special technical feature lies (a) in the fact that the channels of the distribution foil extend from either a first edge or proximal position to a second edge or proximal position and (b) that the cover foil is co-extensive with a substantial part of the distribution foil to enclose a part of the length of the distribution foil channels. Species 3's special technical feature lies (a) in the fact that the channels of the distribution foil extend from either a first edge or proximal position to a second edge or proximal position and (b) in the placement of the distribution membrane (between an MEA and fluid flow plate). Since all the species, as listed above have the special technical feature as identified, wherein the specified special technical feature of each species is different, the species are seen to be distinct.

The relevant portions of independent claims 1, 9 and 15 are reproduced below.

1...

a distribution foil having a plurality of distribution foil channels formed in a surface thereof and extending from a first edge of the distribution foil to a second edge of the distribution foil, the plurality of distribution foil channels terminating at the second edge at positions substantially coincident with respective ones of the plurality of field plate channels; and

a cover foil extending over the distribution foil to enclose the distribution foil channels
and thereby form conduits for water between the distribution foil and the cover foil

9...

a distribution foil having a plurality of distribution foil channels formed in a surface thereof, the distribution foil channels each extending from first positions proximal to, or at a first edge of, the distribution foil to second positions proximal to, or at a second edge of, the distribution foil, the distribution foil channels terminating at the second positions substantially coincident with respective ones of the plurality of field plate channels; and a cover foil co-extensive with a substantial part of the distribution foil to enclose the distribution foil channels over at least part of lengths of the distribution foil channels between the first and second positions and thereby form conduits for water between the distribution foil and the cover foil.

15...

a distribution membrane interposed between the fluid flow field plate and the MEA, the distribution membrane having a plurality of water conduits extending therethrough between first positions proximal to, or at a first edge of, the distribution membrane to second positions proximal to, or at a second edge of, the distribution membrane, the plurality of water conduits terminating at the second positions substantially coincident with corresponding field plate channels.

Given the Examiner's position that the special technical features are those underlined above, she appears to be alleging that the contribution over the art is in the extensions of the channels, the extent of the cover foil, and/or the location of the MEA. We disagree. Rather, the contribution over the art, and thus the special technical feature common among claims 1, 9 and 15 includes the distribution foil/membrane with water conduits/channels having terminations that are substantially coincident with corresponding field plate channels. As is clear from the arguments presented below, the applied art fails to even show these features generally. Accordingly, we submit that there is unity of invention under PCT standards, and respectfully request that all claims be examined.

Next, claims 1 to 8 were rejected under §112 for the reasons noted on pages 3 and 4 of the Office Action. The claim amendments above are believed to address these rejections. Regarding paragraph 11 of the Office Action (omission of essential elements),

the omitted element is not a fuel cell, contrary to what is said in the Office Action. Rather, the claims are to fuel cell assemblies, which include part of a fuel cell, e.g., a fluid flow field plate, and elements associated with the fuel cell, e.g., a distribution foil/membrane. This is roughly akin to claiming a chair assembly comprising a seat and a seat cushion. In this hypothetical, the preamble may recite a chair assembly, but the body of the claim need not recite a chair. Accordingly, withdrawal of the §112 rejection is respectfully requested.

Claims 1, 2 and 6 to 8 were rejected over U.S. Patent No. 6,066,408 (Vitale) in view of U.S. Patent No. 6,303,245 (Nelson); and claim 2 to 5 were rejected over Vitale and Nelson in view of U.S. Patent No. 5,998,054 (Jones). Although the claims have been amended, these amendments have not been made to address the substance of the art rejections. Accordingly, this should be viewed as a traversal of those rejections.

Independent claim 1 is shown below.

1. A fuel cell assembly comprising:
a fluid flow field plate having a plurality of field plate channels formed in a surface thereof that extend across the surface in a predetermined pattern;
a distribution foil having a plurality of distribution foil channels formed in a surface thereof and extending from a first edge of the distribution foil to a second edge of the distribution foil, the plurality of distribution foil channels terminating at the second edge at positions substantially coincident with respective ones of the plurality of field plate channels; and
a cover foil extending over the distribution foil to enclose the distribution foil channels and thereby form conduits for water between the distribution foil and the cover foil.

The applied art is not understood to disclose or to suggest at least the underlined portions of claim 1 above. In this regard, Vitale describes a prior art technique, such as that described in the following excerpt of this application:

[0010] In the prior art, this is conventionally achieved by humidifying the feed gases, either fuel, air or both, fed via manifolds 21, 22 or 23 and channels 16. A disadvantage with this technique is that in order to maintain sufficient humidification levels, the inlet gas streams often require heating and supplementary apparatus to introduce water vapour into the flowing gas streams.

The Office Action, however, alleges the following with respect to Vitale:

As to claim 1, Vitale et al. al teach of a fuel cell assembly (fig. 1; col. 1, lines 8-12). There is a fluid flow plate (for example cathode plate [216]). Furthermore, there is a distribution-foil (cooler-humidifier plate [202]) wherein with a plurality of channels (fig. 3). (It is noted that the lands [304] and island lands [306] are taken to form a plurality of channels within channel [218]. Additionally, it is noted that although not depicted, that one embodiment includes a plurality of channels (col. 7, lines 59-63). As seen in fig. 2C, portions of the channel of cooler-humidifier plate [202] extends through the plate, constituting a first edge (see bridge passage [224], as interpreted with respect to the portion facing the fuel cell plate [204],) and a second edge (with respect to the humidification side [214]) (for example depicted by the gas outlet [226] portion on the humidification side, as connected to the fuel cell plate [204] facing portion via channels [218] and bridge passage [224]) (fig. 2C, fig. 3). It can be seen in fig. 2C that the

channels of the cooler-humidifier plate [202] are coincident with those of the cathode flow plate [216]. The embodied material for the cooler-humidifier plate [202] is stainless steel (thus qualifying it to be considered a foil) (col. 6; lines 33-35). It is noted that the cathode plate [216] is seen to be a cover extending over the distribution foil (humidifier plate [202] to enclose the channels and form conduits for water between them, as Vitale et al. teach that plate [216] serves the purpose of closing open-face flow channels [218] of the cooler-humidifier plate [202], wherein the wick of the coolant-humidifier plate [202] provides water to the reactant gas (col. 6, lines 44-46; col. 7, lines 64-65; fig. 3).

¹ Office Action, pages 6 and 7

We respectfully disagree with the foregoing characterization of Vitale. As shown in its Figs. 2A and 2B below, Vitale discloses a humidification plate 202 having a channel 206 for mixing cathode gas and water to humidify a gas stream.

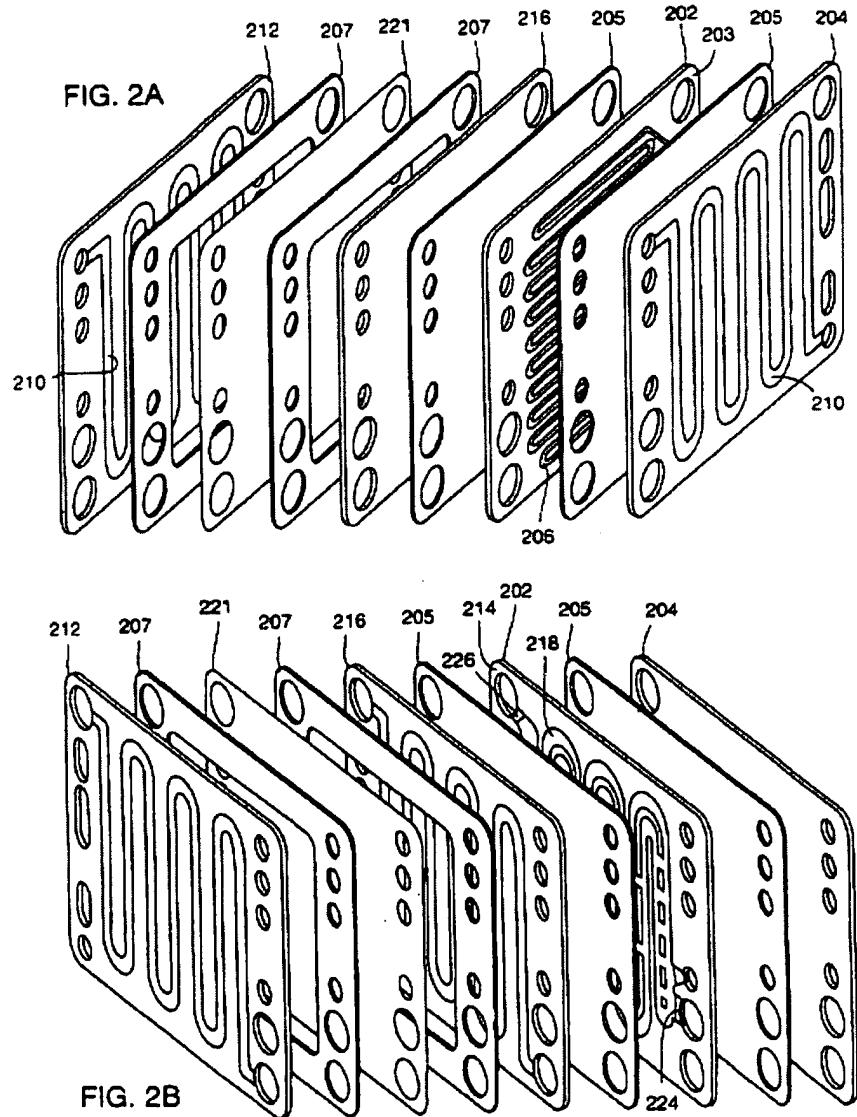
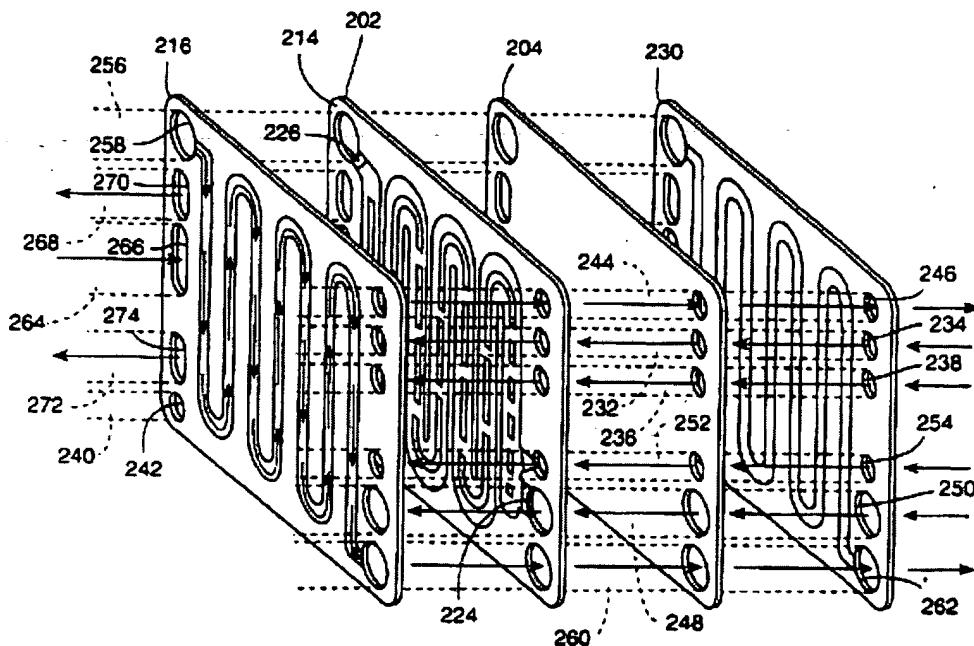


Plate 202 delivers humidified gas to a single exit point 226, from which the humidified gas is delivered via hole 258 to cathode flow plate 216, as shown in Fig. 2C below.

FIG. 2C



While it is true that col. 7, lines 59 to 63 describes the use of multiple channels, we do not believe that Vitale describes that such channels terminate at the second edge at positions substantially coincident with respective ones of the plurality of field plate channels. Rather, as we understand it, a humidified gas stream from plate 202 would need to pass through hole 258 (above) to pass to a channel of Vitale's flow plate. As such, the termination is not substantially coincident. Nor is there any disclosure or suggestion, in Vitale, of a plurality of channels having terminations that are substantially coincident with

corresponding field plate channels. Rather, as explained, Vitale appears to suggest a single termination point, which is contrary to what is being claimed.

Furthermore, channel 202 does not *distribute* water, but rather conveys a humidified gas stream from one part of the plate to another.

Nelson, which was cited for its alleged disclosure of a foil, is not understood to disclose or to suggest anything that would remedy the foregoing deficiencies of Vitale vis-à-vis claim 1. Accordingly, claim 1 is believed to be patentable.

Independent claims 9 and 15 are believed to be patentable for at least the same reasons explained above with respect to claim 1.

Dependent claims are also believed to define patentable features. Each dependent claim partakes of the novelty of its corresponding independent claim and, as such, each has not been discussed specifically herein.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

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In view of the foregoing amendments and remarks, we respectfully submit that the application is in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

The undersigned attorney can be reached at the address shown below. All telephone calls should be directed to the undersigned at 617-521-7896.

Please apply any fees or credits due in this case to Deposit Account 06-1050 referencing Attorney Docket No. 17638-005US1.

Respectfully submitted,

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